

REMARKS

Claims 1 through 14 are pending in this application and have been rejected in the Office Action dated November 19, 2002. In response to that Office Action, claims 1, 5, 7, 9 through 11, 13 and 14 have been amended. Care has been taken to avoid the introduction of new matter. Favorable reconsideration of this application is respectfully solicited.

Objection has been made to claim 14 for failing to further limit the scope of its parent claim 10. In response claim 14 has been amended to recite that the laser source is arranged so that the first beam is linearly polarized. This recitation further limits claim 10, which is silent as to the arrangement of the laser source. It is submitted, therefore, that the objection has been overcome. Withdrawal of the objection is respectfully solicited.

Claims 1 through 14 have been rejected under the second paragraph of 35 U.S.C. § 112 for the presence therein of a trademark name. In response, all claims originally containing the trademark name have been amended to delete the phrase "Grating Light ValveTM" and substitute therefor the phrase "diffraction grating light valve." As this phrase is definitive and well understood in the art, it is submitted that this rejection now has been overcome. Withdrawal of the rejection is respectfully solicited.

Claims 1 through 4, 7 through 12, and 14 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent 6,411,425 (Kowarz). The statement of the rejection at paragraph 6 of the Office Action recognizes that Kowarz et al. does not disclose "the second laser beam being linearly polarized in the direction substantially parallel to the predetermined direction." However, the Office Action held that, as

Kowarz discloses that light polarized by the waveplate 95 enters the grating light valve modulator, it would have been well known to the artisan that the grating light valve modulator is sensitive to the polarization direction of the incident light. In view of this, it was concluded that "the second laser beam being linearly polarized in the direction substantially parallel to the predetermined direction", as a result of optimization of the polarization direction of the incident light, would have been obvious to a person having ordinary skill in the art.

Reconsideration of this position is respectfully solicited. Kowarz explicitly defines the waveplate 95 as a "1/4 waveplate" (see column 9, line 63). The 1/4 waveplate is used for converting a linearly polarized beam into a circularly polarized beam, and therefore, the configuration shown in Fig. 15 of Kowarz is regarded as a so-called "optical isolator". That is, the waveplate 95 is one of the constituents of the optical isolator for isolating incident light and reflected light within limited space. The waveplate 95 is not directed to control the polarization direction of the light entering the grating light valve modulator. Thus the disclosure of Kowarz would have led the artisan to assume that the light entering the grating light valve modulator is circularly polarized light. It is respectfully submitted, therefore, that it cannot be concluded that it would have been obvious to modify the incident polarization of the laser beam of Kowarz such that the linear polarized laser beam is parallel to the orientation of the ribbon elements for obtaining an optimal modulation of the laser beam.

With respect to claims 4, 8 and 9, the Office Action stated that "it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art". However, in the technical field of the present invention, the common

peak wavelength of the laser beam is 830 nm. Unless modulation of the peak wavelength is explicitly disclosed, it is submitted that the artisan would naturally assume that the light entering the grating light valve modulator has a peak wavelength of 830 nm. Other than improper hindsight consideration, there would have been no reason apparent to the artisan to provide a peak wavelength of the laser beam in a range between 800 nm and 820 nm.

Withdrawal of the rejection of claims 1 through 4, 7 through 12, and 14 is respectfully solicited.

Claims 5 and 6 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent 6,084,626 (Ramanujan). Claim 13 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kowarz in view of Ramanujan.

While Ramanujan discloses that the diffraction modulator disclosed therein is sensitive to the polarization direction of the incident light, there is no suggestion that the conventional diffraction grating modulator is sensitive to the polarization direction of the incident light. Ramanujan states that "the incident light is polarized along the z-axis" (column 10, lines 7-8, or column 14, line 63, for example). Ramanujan further states that "the 'z-axis' is c-axis of crystal" (column 9, line 61). Thus Ramanujan teaches that the diffraction modulator is sensitive to the polarization direction according to anisotropy of an electro-optical crystal used for the diffraction modulator. Therefore, it would not have been obvious from the Ramanujan teachings that the diffraction modulator is still sensitive to the polarization direction of the incident light even when the diffraction modulator uses no electro-optical crystal.

As seen from Fig. 7a of Ramanujan, for example, the "z-axis" is shown to be perpendicular to the arrangement direction of the diffraction grating (parallel to the lengthwise direction of each reflective element of the grating). That is, the incident light of Ramanujan has a polarization direction at an angle different by 90 degrees from the one of the incident light of the present invention which is characteristically "linearly polarized in a direction substantially parallel to said predetermined direction". In view of this, and from the disclosure of Ramanujan et al., it is urged that reconsideration be given to the conclusion in the Office Action that the conventional diffraction grating modulator is sensitive to the polarization direction of the incident light, and such polarization direction is parallel to the arrangement direction of the reflective elements of the grating. Withdrawal of the rejection of claims 5, 6 and 13 is respectfully solicited.

In summary, it is submitted that all objections and rejections have been overcome. Allowance of the application is respectfully solicited.